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## Author Affiliation:

Department of Logistics and Transport Technology, Federal University of Technology Akure, Nigeria

## Corresponding author

Department of Logistics and Transport Technology, Federal University of Technology Akure, Nigeria  
Email: foakinsehinwa@futa.edu.ng

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# Factors influencing passengers' choice of intercity bus operators in Lagos State, Nigeria

Feyisola O Akinsehinwa\*, Mobolaji S Stephens, Adedotun J Adenigbo

## ABSTRACT

The importance of intercity bus services in the world cannot be overemphasized as it enhances long-distant travel on the road. This study examined the factors influencing passengers' choice of intercity bus operators in Lagos, Nigeria. To achieve this, five intercity bus operators were selected and a total of forty-six (46) bus terminus were sampled. Three thousand copies of questionnaires (3000) were distributed among the five intercity bus operators through the assistant of the terminal managers across the forty-six-terminal operated by the bus companies, two thousand six hundred and eighty-two copies of questionnaires (2682) were retrieved and found useable for analysis. Primary data were collected using structured questionnaire, the data collected were arranged systematically and coded to facilitate analysis and data were subjected to descriptive statistics evaluation. Multiple linear regression analysis was adopted for the study. Passenger's choice of operator revealed that for ABC transport, advertisement, frequency of operator's service, reliability of service and expectation of future price were the most significant factors influencing choice of customers to use the operator's service. For CHISCO transport, it was observed that among the factors influencing passenger's choice, the frequency of operators' service has ( $\beta=0.883$ ,  $p \leq 0.05$ ) is the most significant factor, reliability of service has ( $\beta=0.488$ ,  $p \leq 0.05$ ), fare has ( $\beta=0.455$ ,  $p \leq 0.05$ ). Based on the findings the study therefore recommends that frequency and reliability of service should be geared up by the respective intercity bus operators in other to improve their service quality to their existence customers and to attract their potential customers.

**Keywords:** Influencing factors, Choice, Intercity, Bus Operators by Passenger in Lagos State, Nigeria

## 1. INTRODUCTION

Public transport operation in Nigeria is basically the responsibility of a joint group of the private and public sector operators. According to Remi and Ilori, (2008) the largest provider of public bus passenger services are the private sector operators. The currently provides more than 90% of all urban passengers' transport services in Nigeria. Among this group are the relatively few large-scale operators of bus fleet, who usually provide long-haul, while so many other operators of small vehicle units such as minibuses, taxis, space-wagons and

semi/smaller coastal buses which also provide both inter urban passenger transport services are unincorporated but belong to one association or the other.

More the public and private transport operators are majorly owned by the government and private individuals respectively and also permit for franchising. Private operators are well dominant in intercity transport services in Nigeria dictating largely the operational characteristic in terms of facility provision, services and standards in the industry. Such decisions are usually economically based and most times not totally in favour of the intended passengers. Part of the difficulties faced by the operators of the intercity road passenger transport services in Nigeria is the lack of understanding of intercity travel behavior and analysis of trip generation and socio-economic development factors in an area. This transport sub-sector has witnessed appreciable development.

Public transport operators possess unique operational characteristics that influence their service delivery and qualities and as such informing the choice of passengers of an operator at the expense of other operators on same service route. Virtually every operator of bus service has their unique features and always distinguish the service offered to their customers in order to have an edge in the competitive market, comparing the services they offered to their customers will make a great deal and inform the level of their patronage.

According to Emenike, (2005) 90% of the daily passenger traffic uses the highways, the intercity bus transport has become an indispensable part of our daily life, especially in the large developing urban cities in Nigeria. It has been a supporting industry for the nation to meet the goals of improving mobility, protecting the environment and saving energy. Over the years, there have been phenomenal increases in the demand for intercity passenger transport in the fast-growing cities in Nigeria. This is due to increased personal income, improved transportation infrastructures and availability of vehicles for long distance travels in the market (Daniel and Iteun, 2013).

In Nigeria for instance, the demand for intercity and regional trips in public transport rose from 41.5% in 1986 to about 65% in 1990 (Daniel and Iteun, 2013). The increase in the number of intercity bus operators has resulted in the introduction of all variety of enticements by the operators to the passengers, more often; the big players/operators are aware of the competitive nature of the industry with a few others and use its operational attributes as a means to attract more passengers' patronage.

Road transportation is the principal mode of transport in Nigeria, accounting for the vast majority of freight and passenger travel. Intercity transport is an essential ingredient in enhancing productivity since there is always the need to move or transfer and distribute people and things. Admittedly, one important role of transport is that it is a catalyst for other factors of production (Iles, 2005). The function of intercity transport in this spectrum is to provide the means of effecting such movements from city to city (Burgdorf et al., 2018), the need for the provision of an effective and adequate intercity transport services has become critical and inevitable (Matthews, 2013).

Significant interest has been generated in recent years concerning the operation of the intercity bus industry (Khan and Chowdhury, 2014). The reasons for this interest include the numerous challenges resulting to competition experience by the and operators of this industry, which ranges from acquiring of executive to higher capacity buses with adequate sitting space and comfort at higher cost, high cost of operation to attract patronage (passengers) edging the less financially buoyant operators, availability of air conditioner, availability of large variety of fleets (vehicles) (Bronkhorst, 2019; Woldeamanuel, 2012).

Evidently, the strategies adopted by the transport providers in order to attract patronage have influenced their level of competition. Therefore, the aim of this study is to investigate the passengers' choice of intercity bus operators in Lagos, Nigeria. Therefore, while it can be said that many researchers have contributed to the knowledge of intercity transport, its importance and impacts on the socio-economic development of Nigeria, not much has been done in this area relating to passengers' choice of intercity bus operators.

## Literature review

### *Intercity travel*

Intercity travel is the travel between cities or other points of interest that are separated by some significant distance Kato et al., (2010) observed that when the travel distance is over 100km, it is categorized as inter-urban travel. The scholars in transportation field generally refer to long-haul travel as intercity travel. There are several ways to define long-haul travel, without a current consensus among those in the research community. Definitions vary from using a distance threshold, ranging from 50 to 200 miles, to only including intercity or interregional travel (Aultman-Hall et al., 2015) or only considering non-routine travel. For some people though, a trip of 50 miles might not even cover their one-way workday commute, or long-haul travel might just be a regular part of their routine.

The term long-haul travel is defined as trips of a certain minimum distance. Travel frequency distinguishes intercity travel behaviour from urban travel behaviour in certain aspects. However, intercity travel behaviour is a display of the major four-step model of travel behaviour in urban society. They are trip generation, trip distribution, modal choice and trip assignment. On this note, travel decision for intercity trips are made based on assumptions which made up of trip generation, destination choice, mode choice and route choice.

### *Intercity bus transport*

Intercity bus transport is a service provided for moving long distance travelling passengers from their origin to destination. Intercity bus service generally has a single stop at one location in or near a city and travels long distances without stopping at all (Bronkhorst, 2019). Consequently, any hindrance in the operation of buses, affects levels of service and demand for buses which in a long run can lead to excessive exploitation of resources (Woldeamanuel, 2012). The Federal Transit Administration (FTA) provides the characteristics of intercity bus transportation service such as regular scheduling, available to the general public, makes limited stops, operates on fixed routes, connects urban areas not in close proximity, predominantly passenger service (any package /goods service incidental).

### *Passenger choice of bus operators*

The advent of organised operators in the industry has made the competition in the Nigerian road sector to keep growing. Unlike the roadside, otherwise regarded as open-market operators whose activities appear to be anti-passengers in terms of the way and manner they treat the passenger, the organized operators have well thought out programmes and packages for the customers, seeking their satisfaction in the methods of providing transport services (Agu et al., 2015). Among the organised operators in the industry, the passenger is the one that will choose the particular bus operator for their trip.

Commuters are perceived to act as rational beings, choosing travel means most likely to offer them maximum utility. There is little doubt that a wide range of factors influence the patronage of a transportation company. Polat, (2012) identified the following as patronage determinants: Fare, travel time (walk access time and accessibility of the transportation company, waiting time (in vehicle), journey time, service quality, comfort, reliability, availability and costs of alternative travel means, time of travel, purpose of travel and lastly the level of dependability.

The study conducted by Fitzroy and Smith, (1998) found that service quality is an important variable that influences the patronage of a transportation company. Service quality includes waiting time, service frequency, operating speed, reliability and comfort. Although the degree of importance attached to comfort may differ from one group of passengers to another based on the journey time, journey purpose and passenger type, comfort is a quality factor that should be considered (Polat, 2012).

Ojo et al., (2014) conducted a study on drivers and passenger's perspectives on factors influencing intercity bus travel time on the Accra-Takoradi route in Ghana. The study involved the use of in-depth interviews conducted on fourteen drivers and forty-two passengers of seven bus operators (carriers) on the route. The factors identified by the study are time of departure, purpose of travel, day/night journey, volume of traffic on the route, place of refuelling, number of stoppages for passengers, etc.

Gbandi and Kadiri, (2015) conducted a study on the influence of advertisement on consumer patronage of commercial road transport services in Benin City, Edo State, Nigeria. The study adopted purposive and systematic sampling methods in collecting data from a sample size of 500 respondents using a five likert scale questionnaire design. Data were collected from five highest advertised commercial road transport companies in Benin City and were analysed using a multiple regression analysis. It was found that informative, persuasive and reminder advertising was all significantly related to customers' patronage.

In the previous study the assessment of factors influencing public transport mode preference and patronage among students at the University of Cape Coast Ghana, it was revealed that the decision or passenger choice was influenced by perceived safety, comfort, convenience, reliability and fare charge. It was also revealed that the government owned fleet were the most preferred than private operators.

Bus quality services may be defined using various attributes that cover items such as service coverage, frequency of services, hours of services and service reliability (Munzilah et al., 2013). The quality of bus operation services is mainly influenced by the choice of intercity buses as a preferred mode of travel by travellers in the city. Previously, users tend to be satisfied with basic services and the availability of routes and the location of service. However, transit users today are more demanding from the bus providers including fast and reliable service, shorter walking distance to stops, low floor buses, cheaper service and friendly safe drivers.

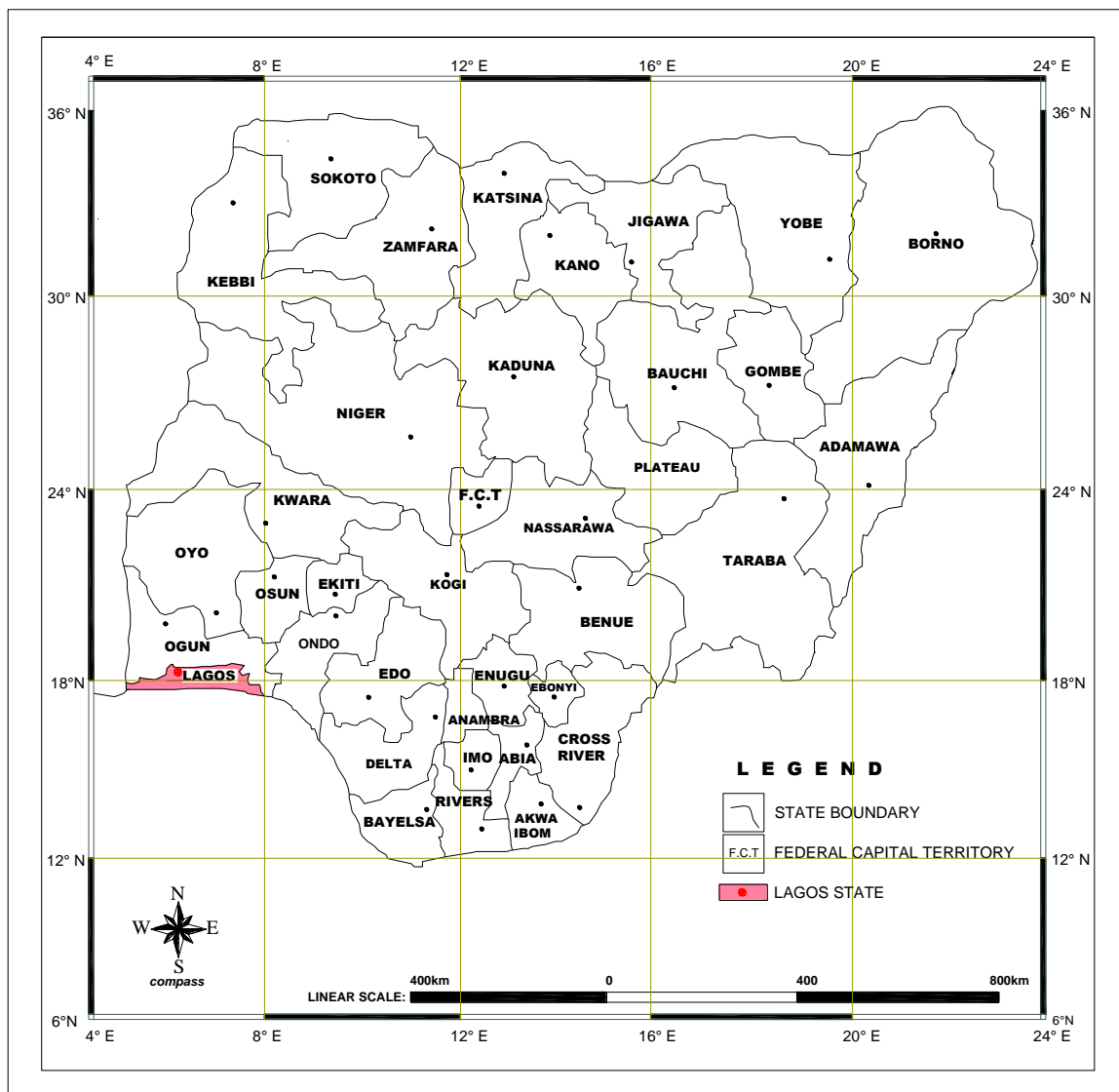
## 2. METHODS

### Research Design

The research design adopted is primarily descriptive survey design. The intercity bus passengers and the intercity bus service providers were sampled to ascertain their operational characteristics and the challenges they encounter. To determine the factors influencing passengers' choice of intercity bus operators, multiple regressions was adopted as the analytical tool.

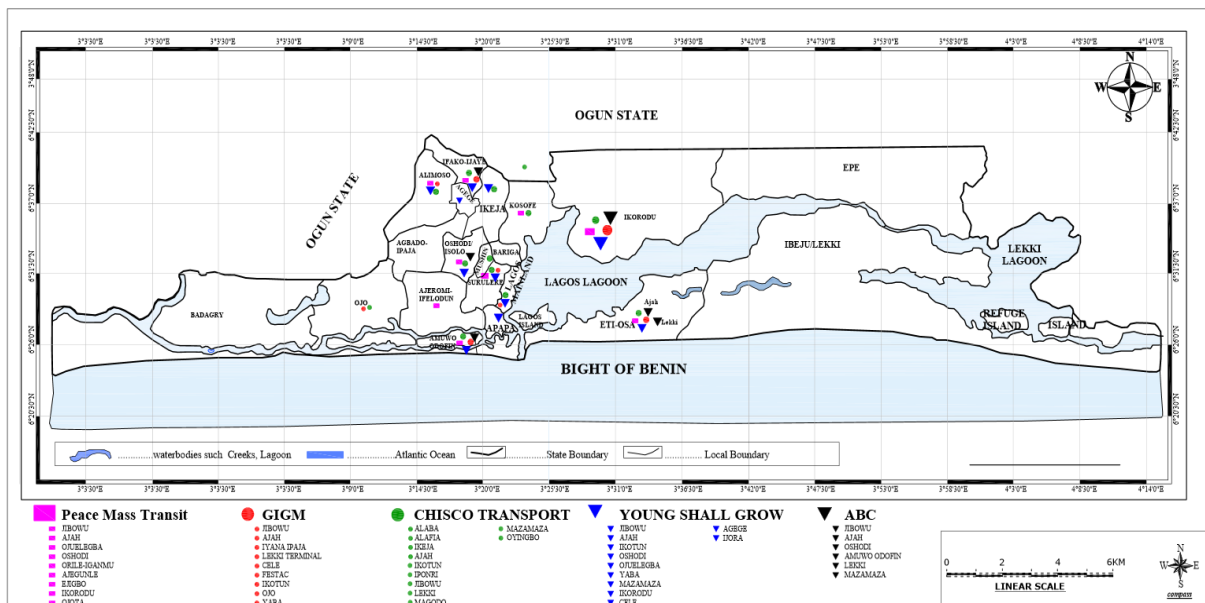
### Study Area

Lagos is a port city and the most populous city in Nigeria. Lagos Metropolis is in the south-western part of Nigeria and occupies 3577 km<sup>2</sup>, representing about 0.4 percent of the Nigerian land area. In 2016, Lagos has an estimated population of over 21million, which makes it the largest city in Africa. With a population density of 2,519.85 people per square kilometre and projected to become the third largest mega city after Mumbai (India) and Tokyo (Japan) by 2019, when its population will be about 24 million. The city harbours over 60 percent of the nation's commerce and accounts for 80 percent value added of manufacturing. It also accounted for over 40 percent of domestic aircraft take-off and landing, 78 percent of incoming freights and handled over 99 percent total non-oil exports. Figures 1 and 2 shows the map of Nigeria and Lagos respectively.



**Figure 1** Map of Nigeria Showing Lagos State

Source: Author's Survey, (2021)



**Figure 2** Map of Lagos State Showing the Study Areas

Source: Author's Survey, (2021)

Lagos plays a pivotal role in national and regional interaction. About 70 percent of intercity movement originates from Lagos, and close to 65 percent of intercity trips has Lagos as destination. The city has about 9,560 Km roads which is equivalent to 0.88 kilometres per 1000 persons and over 160 intercity road transport terminals with limited rail and inland water transport service. Lagos State has been experiencing huge population increase in the past four decades. This is due to rural-urban migration and galloping urbanization in most developing countries.

These have led to enormous challenges in terms of infrastructure provision. Public modes of transportation are provided by either the Federal, State, Local government or Private. The first generation of public transport operators in Lagos came into existence shortly after Nigeria's political independence. These include the Isale-Eko Bus services, which collapsed in 1976. Many more transport operators sprang up between 1970 and 1980. They include Mainlanders Transport Corporation, Alimosho Line and Ikeja Transport Corporation, which also collapsed because of inadequate government financial support and qualified staff to manage their operations, political interference and uncontrolled competition with para-transit operators.

Nigeria has about 1,500,000 vehicles at the rate of 1 motor vehicle per 1000 people and ranked 131<sup>st</sup> in the world with a vehicle density of 2.69 per square km. Lagos share of this is over 50 percent with over 141,265 vehicles registered in 2006. To make Lagos a globally competitive city, the Bus Rapid Transit and Lagos Bus Service scheme were introduced in 2008 with a 10,000 passenger's capacity per hour per direction, also just of recent April 2019 to be precise, the Lagos state government successful open a world class Oshodi transport interchange.

### Research Population

The research population for the study were in two sets. There are two groups of respondents that served as the population for the study; they are bus operators and passengers. The first set comprises the population of intercity passenger bus operators or carriers that operates from Lagos to other parts of Nigeria. These include all registered intercity bus operators in Lagos State that operate from the State to other parts of Nigeria. The register of Lagos Metropolitan Area Transport Authority (LAMATA) showed that there are 109 registered intercity passenger carriers in Lagos operating to other parts of Nigeria. Also, the National Union of Road Transport Workers' Union (NURTW) Lagos State branch showed that there are 250 registered outfits/operators in the State.

The register of LAMATA was used as it does offer more credibility than that of NURTW since it is the legislated authority for transportation in the Lagos Metropolitan area (Lagos State). Therefore, the population for this study is the 109 operators found in the LAMATA's register. The study however sampled five (5) private operators. The selection of the five was done by ranking all the 109 operators using their respective annual traffic (passenger). Table 1 shows the intercity passengers carried by the five intercity bus companies selected for the study. We have the daily, weekly; monthly and annual passengers carried both inward and outward movement. These first five had amongst themselves 15.73 % of the total market share (16,368,214 passengers) as at 2019 (Table 1).

**Table 1** Intercity Passengers Carried in and out of Lagos

Operator	Average				Percentage Passenger Traffic
	Daily	Weekly	Monthly	Annual	
God is Good Motors (GIGM.com)	2449	17140	40000	822720	32
Peace Mass Transit (PMT)	1717	12020	56320	576960	22
Young Shall Grow Transport (YSGT)	1537	10760	44800	516480	20
CHISCO Transport Nigeria (CTN)	1060	7420	43200	356160	14
ABC Transport PLC (ABC)	900	6300	30240	302400	12
Total	7663	53640	214560	2574720	100

Source: Field Work, (2021)

The second set was the population of passengers using the service of the five bus operators that had already been identified as the market leaders. This population is large and can be considered to be infinite but to get a definitive value, the pilot survey carried out to identify the selected five intercity passenger transport operators was used to estimate number of passengers they carry annually and segregated to monthly, weekly and daily levels.

### Sample Size and Sampling Technique

The sample size for this study is the intercity bus operators (selected carriers) and the intercity passengers moved outward Lagos by the selected carriers. It is known that the total passengers moved by these carriers for the period to be considered are for arrival and departure movement in Lagos. Therefore, it can be assumed that the number of passengers carried out of Lagos is half of the total since the fleet size and capacity does not change in the short and mid-term. The sample size is therefore

$s_f = T_i/2$  where  $s_f$  sampling frame and  $T_i$  is total traffic carried.

$s_f = 53640/2$

$s_f = 26820$

For the sake of resources and time the sample size was pegged at ten percent of the sample frame and that gives 2682 passengers for the whole operators for a week. This was approximated to the next thousand-figure which is 3000. The questionnaire was shared amongst the five operators by adopting the percentage passenger traffic of each operator as captured (Table 1, 2).

**Table 2** Questionnaire distribution amongst operators

Operator	% Distribution	Distributed
ABC Transport PLC (ABC)	12	352
CHISCO Transport Nigeria (CTN)	14	415
God is Good Motors (GIGM.com)	32	959
Peace Mass Transit (PMT)	22	672
Young Shall Grow Transport (YSGT)	20	602
Total	100	3000

Source: Field Work, (2021)

For the first set of questionnaires given to the operators, since it has been identified that the selected five operators have forty-six (46) terminals in different location across the state. The sampling technique adopted was purposive sampling as the questionnaire was administered on the number of terminals operated by each of these five bus companies. However, for the second set of questionnaires simple random sampling technique was adopted which gives every passenger the equal chance of being surveyed.

### Method of Data Collection and Instruments

The study used the primary data collection. The data collection was done over a five-week period, devoting a week per operator. Primary data collection method was employed using two sets of questionnaires:

Questionnaire for operators; and

Questionnaire for passengers



The Lagos headquarters of the bus operators were visited, and both sets of questionnaires were dropped for onward delivery to their respective terminals where they were administered by the terminal managers with the assistant of supervisors of the bus operators. For the passengers' questionnaire, a total of 3,000 questionnaires were administered and the distributed values for each operator given (Table 2).

**Table 3a** Terminals and their locations (PMT)

No.	Terminals in Lagos
1	Ajah, Eti-Osa Lagos
2	Ajegunle, Ajeromi-Ifelodun, Lagos
3	Ejigbo, Alimoso, Lagos
4	Ikorodu, Lagos
5	Jibowu, Shomolu, Lagos
6	Ojota, Kosofe, Lagos
7	Ojuelegba, Surulere, Lagos
8	Orile-Iganmu, AmuwoOdofin, Lagos
9	Oshodi, Oshodi-Isolo, Lagos

Source: Field work, (2021)

**Table 3b** Terminals and their locations (YSGM)

No.	Terminals in Lagos
1	Ajah terminal
2	Agege terminal
3	Cele bus stop terminal
4	Ikotun terminal
5	Ikorodu terminal
6	Ijora terminal
7	Jibowu terminal
8	Oshodi terminal
9	Ojuelegba terminal
10	Mazamaza terminal
11	Yaba terminal

Source: Field work, (2021)

**Table 3c** Terminals and their locations (CTN)

No.	Terminals in Lagos
1	Alaba terminal
2	Alafia terminal
3	Ikeja terminal
4	Ikotun terminal
5	Iponri terminal
6	Jibowu terminal
7	Lekki terminal
8	Magodo terminal
9	Mazamaza terminal
10	Oyingbo terminal
11	Surulere terminal

Source: Field work, (2021)

**Table 3d** Terminals and their locations (GIGM)

1	Ajah terminal
2	Cele terminal
3	Festac terminal
4	Ikotun terminal
5	Iyana- ipaja terminal
6	Jibowu terminal
7	Old ojo terminal
8	Yaba terminal
9	Lekki terminal

Source: Field work, (2021)

**Table 3e** Terminals and their locations (ABC)

No.	Terminals in Lagos
1	Ajah Lagos terminal
2	AmuwoOdofin terminal
3	Bolade Oshodi terminal
4	Jibowu terminal
5	Lekki terminal
6	Mazamaza terminal

Source: Field work, (2021)

The retriever or the collection of the questionnaires was done in person from each of the 46 terminals after a week, over a five-day period. The questionnaires retrieved from the operators were tabulated (Table 4). The success rate for the distributed questionnaire is eighty-nine (89) percent.

**Table 4** Retrieved Questionnaires

Operator	Distributed	Retrieved
ABC Transport PLC (ABC)	352	315
CHISCO Transport Nigeria (CTN)	415	371
God is Good Motors (GIGM.com)	959	857
Peace Mass Transit (PMT)	672	601
Young Shall Grow Transport (YSGT)	602	538
Total	3000	2682

Source: Field Work, (2021)

### Model Specifications

The model specification for the study was multiple regression as shown in the equation 1 below

$$O - D_i = b_0 + b_1r_i + b_2c_i + b_3f_i + b_4m_i + b_5p_i + b_6q_i + b_7d_i + b_8t_i + e_i \dots \dots \dots (1)$$

where  $O - D_i$  = Operator  $i$  choice of route (origin-destination);  $b_0$  = intercept;  $b_0, b_1, \dots, b_k$  are the coefficients of the independent variables. These variables on  $O-D_i$  are  $r_i$ = revenue;  $c_i$ = condition of the road network;  $f_i$ = fuel cost spent;  $m_i$ = application of monopolistic power;  $p_i$ = assurance of return passenger traffic;  $q_i$ = passenger demand;  $d_i$ = distance;  $t_i$ = turnaround time and  $e_i$ = error terms not captured.

Recall that  $i$  represents the intercity operator of the bus companies and there are five intercity bus operators meaning that we have  $i_1, i_2, i_3, i_4$  and  $i_5$ . The computation of the choice of routes will be done for all the operators for selected routes using patronage or throughput levels.

## 3. RESULTS AND DISCUSSION

It has been revealed above that sustainability of intercity bus operations depends to a large extent on optimal capacity utilization of assets over time. This implies that load factors must be very high, if 100 % cannot be sustained. To get these, bus operators will have



to convince passengers through efficient service delivery to keep up the patronage. Profitability, revenue generation and sustainable operations of intercity passenger service depend on the revenue-passenger-kilometre the operators were able to generate. This fact is premeditated the operators' ability to attract patronage, which is further a function of passenger's choice of their respective services. This makes the knowledge of factors that influencing passengers' choice of operators to be very important to the sustainability of intercity bus passenger operations. Which was our main reason to determine the factors that influences customer choice of intercity bus operator has they embark on trips out of Lagos.

To this end, attributes or factors that determine choice of intercity bus passengers (commuters) were considered as they make their trips out of Lagos. These attributes/factors are advertisement/publicity; frequency of operators' service; reliability of service; expectation of future price; proximity to terminal (accessibility); fare of services of other operators on same route; taste and preference; and changes in propensity to travel and fare. Choice making decision of all passengers using the five selected intercity bus operators were assessed respectively for each of the operators, in the first instance and collectively for all of them to determine the significant factors that influencing choice of operators using multiple regression analysis.

### Factors influencing the choice of intercity bus operators by passenger of ABC transport service

For ABC transport, a total of 315 passengers' choice decision-making was observed and it was noted that the value of the  $R^2$  was 0.872 this implied that 87.2% of the choice of operator for ABC transport were explained by the predictor variables such as advertisement, frequency of operator's service, reliability of service and expectation of future price. Hence, the remaining 13% were other factors that are not captured in the study. Also, the correlation value of 0.761 implies that there is a strong relationship between the passenger choice of ABC transport service and the factors influencing the choice factors (Table 5). The result of the regression analysis showed that choice of passenger for ABC transport company was influenced by advertisement ( $\beta=0.457$ ,  $p \leq 0.05$ ), frequency of operator's service ( $\beta=0.460$ ,  $p \leq 0.05$ ), reliability of service ( $\beta=0.368$ ,  $p \leq 0.05$ ) and expectation of future price ( $\beta=0.343$ ,  $p \leq 0.05$ ). This was corroborated in the study of Soehodho and Nainggolan, (2005) on public transport users' attitude based on choice model.

From the significant choice factors, advertisement was the most significant factor that influenced the passenger choice of ABC transport service. It implies that ABC transport has invested hugely on advertisement by creating awareness to market different services they render to the public, advertising have a positive impact in helping companies that have reposition themselves in attracting new customers and retaining their existing one. This agrees with the study of Gbandi and Kadiri, (2015) that observed that advertisement has significant influence on customer patronage of commercial buses in Benin. This means that customer patronage will improve when commercial road transport companies (intercity bus operators) undertake advertising activities. The expectation of future price changes was the least significant factor that influenced the passenger choice of ABC transport service. This may be because ABC adopts online booking, and possible advance bookings will result to a discounted fare. Satiennam et al., (2011) and Thamizharasan and Vedagiri, (2011) noted that online booking and possible advance bookings enhances discounted fare among public transport.

**Table 5** Regression Statistics for Factors influencing Choice of Operators for ABC

Multiple R	0.872305							
R Square	0.760916							
Adjusted R Square	0.751398							
Standard Error	4.528928							
Observations	315							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	9	19975.58	2219.508	108.2096	1.78E-89			
Residual	306	6276.425	20.51119					
Total	315	26252						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	6.349523	1.441166	4.405825	1.46E-05	3.513637	9.185409	3.513637	9.185409
Advertisement/publicity	0.457214	0.158456	2.885426	0.004187	0.145412	0.769015	0.145412	0.769015

Frequency of operator's service	0.460536	0.189231	2.433724	0.015517	0.088177	0.832895	0.088177	0.832895
Reliability of service	0.368812	0.17043	2.164003	0.031238	0.033448	0.704176	0.033448	0.704176
Expectation of future price	0.343755	0.174646	1.968298	0.049936	9.63E-05	0.687413	9.63E-05	0.687413
Proximity to terminal	0.271811	0.176596	1.539168	0.124797	-0.07569	0.619307	-0.07569	0.619307
Fare of other operators on same route	0.253666	0.170348	1.489098	0.137491	-0.08154	0.588868	-0.08154	0.588868
Taste and Preference	0.184732	0.175394	1.053241	0.293061	-0.1604	0.529862	-0.1604	0.529862
Changes in propensity to travel	0.16533	0.180916	0.91385	0.361515	-0.19067	0.521328	-0.19067	0.521328
Fare	0.056912	0.19018	0.299254	0.764949	-0.31731	0.431138	-0.31731	0.431138

Source: Field work, (2021)

### Factors influencing the choice of intercity bus operators by passenger of CHISCO transport service

The value of the multiple regression analysis for CHISCO transport service is 0.865 this connotes that 86% of the predictor variables were explained by the criterion variable. With the value of  $R^2$  0.754, it shows that strong relationship exists between the independent variables and the dependent variable. The regression analysis result revealed that choice of passenger for CHISCO transport company was influenced by Frequency of operators' service ( $\beta=0.883$ ,  $p \leq 0.05$ ), this implies that across the terminal of the bus company, they stick to the scheduled time for buses departure which in turn prompt travellers to subscribe to their buses. Reliability of service ( $\beta=0.488$ ,  $p \leq 0.05$ ) and fare has ( $\beta=0.455$ ,  $p \leq 0.05$ ) (Table 6). This is corroborated by the study of Sam who found out that fare and reliability influence the choice of bus operators by commuters.  $R^2$  value of 0.754 implies that there is a strong relationship between the choice of bus operator which is the dependent variable and the factors influencing passenger choice. The remaining factors that did not have any influence on passenger's decision making for the choice of CHISCO transport are expectation of future price, advertisement/publicity, changes in propensity to travel, taste and preference, fare of other operators on the same route and proximity to terminal. CHISCO amongst the operators studied has the least degree of adoption of information communication technology (ICT) in its operation and does very little advertisement.

**Table 6** Regression Statistics for Factors influencing Choice of Operators for CHISCO

Multiple R	0.868725							
R Square	0.754683							
Adjusted R Square	0.746499							
Standard Error	6.003101							
Observations	371							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	9	40132.53	4459.17	123.7379	1.3E-104			
Residual	362	13045.47	36.03722					
Total	371	53178						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	6.779117	2.069877	3.275131	0.001158	2.708586	10.84965	2.708586	10.84965
Frequency of operator's service	0.883757	0.201402	4.388032	1.5E-05	0.487693	1.279822	0.487693	1.279822
Reliability of service	0.488078	0.212342	2.298548	0.0221	0.0705	0.905657	0.0705	0.905657
Fare	0.455001	0.214324	2.122961	0.034435	0.033525	0.876478	0.033525	0.876478
Expectation of future price	0.401776	0.207279	1.938338	0.053359	-0.00585	0.809397	-0.00585	0.809397
Advertisement/publicity	0.40148	0.211883	1.894821	0.058913	-0.0152	0.818155	-0.0152	0.818155

Changes in propensity to travel	0.349821	0.213655	1.637312	0.102434	-0.07034	0.769982	-0.07034	0.769982
Taste and preference	0.22339	0.210451	1.06148	0.289179	-0.19047	0.63725	-0.19047	0.63725
Fare of other operators on the same route	0.214764	0.212521	1.010553	0.312905	-0.20317	0.632694	-0.20317	0.632694
Proximity to terminal	-0.00237	0.21629	-0.01095	0.991268	-0.42771	0.422974	-0.42771	0.422974

Source: Field work, (2021)

### Factors influencing the choice of intercity bus operators by passenger of GIGM transport service

For GIGM Transport Company, the multiple regression value is 0.937. This implies that 93.7% of the dependent variable was explained by the independent variables. With  $R^2$  value of 0.878, this shows that a strong relationship exists between the dependent variable and the independent variables. The regression analysis revealed that choice of passenger for GIGM transport company was influenced by all the independent variables, reliability of service has ( $\beta=0.436$ ,  $p \leq 0.05$ ), taste and preference has ( $\beta=0.427$ ,  $p \leq 0.05$ ), expectation of future price has ( $\beta=0.399$ ,  $p \leq 0.05$ ), advertisement ( $\beta=0.394$ ,  $p \leq 0.05$ ), frequency of service ( $\beta=0.385$ ,  $p \leq 0.05$ ), fare charge ( $\beta=0.380$ ,  $p \leq 0.05$ ), fare charge by other operators ( $\beta=0.314$ ,  $p \leq 0.05$ ), changes in propensity to travel ( $\beta=0.316$ ,  $p \leq 0.05$ ) and proximity to terminal ( $\beta=0.296$ ,  $p \leq 0.05$ ) (Table 7). This result agrees with the study of Borlo et al., (2021) which found that fare was the most influential factors in choosing Intercity Bus services in the study Area. This shows that GIGM has done very well in its market research and was able to have all factors, envisaged in this study make significant meaning and influence on their customers. This can be seen in their relatively huge achievement in the short time they have entered the sub-sector – intercity mini-bus operations.

**Table 7** Regression Statistics for Factors influencing Choice of Operators for GIGM

Multiple R	0.937491							
R Square	0.878889							
Adjusted R Square	0.876567							
Standard Error	3.849466							
Observations	857							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	9	91190.01	10132.22	683.76	0			
Residual	848	12565.99	14.81839					
Total	857	103756						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	10.2491	0.780327	13.13436	5.32E-36	8.717503	11.78071	8.717503	11.78071
Reliability of service	0.436343	0.088223	4.945939	9.14E-07	0.263183	0.609504	0.263183	0.609504
Taste and Preference	0.427704	0.090452	4.728498	2.65E-06	0.250167	0.60524	0.250167	0.60524
Expectation of future price	0.399338	0.086604	4.611072	4.62E-06	0.229354	0.569321	0.229354	0.569321
Advertisement	0.394046	0.089428	4.406309	1.19E-05	0.21852	0.569572	0.21852	0.569572
Frequency of operator's service	0.385767	0.089352	4.317387	1.77E-05	0.21039	0.561144	0.21039	0.561144
Fare Charge	0.380394	0.090097	4.222041	2.68E-05	0.203554	0.557234	0.203554	0.557234
Fare Charge by other	0.314172	0.087399	3.594681	0.000344	0.142628	0.485716	0.142628	0.485716

operators								
Changes in propensity to travel	0.316229	0.088586	3.569734	0.000377	0.142355	0.490102	0.142355	0.490102
Proximity to terminal	0.296742	0.090479	3.279682	0.001082	0.119153	0.474331	0.119153	0.474331

Source: Field work, (2021)

### Factors influencing the choice of intercity bus operators by passenger of PMT transport service

For PMT Transport Company, Multiple R is 0.884 which implies that 88.4% of the dependent variable was explained by the independent variables. The  $R^2$  value of 0.781 connotes that a strong relationship exists between the dependent variable and the independent variable. The outcome of the regression analysis revealed that choice of passenger for GIGM transport company was influenced by expectation of future price ( $\beta=0.698$ ,  $p \leq 0.05$ ), this simply implied that the fare charged by PMT does not really change over time, customers have the privilege to book online far ahead of their trip. Changes in propensity to travel has ( $\beta=0.548$ ,  $p \leq 0.05$ ), fare of other operator ( $\beta=0.494$ ,  $p \leq 0.05$ ), fare charged ( $\beta=0.429$ ,  $p \leq 0.05$ ) and reliability of service has ( $\beta=0.330$ ,  $p \leq 0.05$ ), 0.033 (Table 8). They are all significance at 0.05 level of significant. The result agrees with the previous study in 2006 which state that the demand for public transport was influenced by fare in a study conducted in Leeds UK. These factors were not significant in the choice of this operator: Frequency of operator's service, taste and preference, proximity to terminal and advertisement/publicity.

**Table 8** Regression Statistics for Factors influencing Choice of Operators for PMT

Multiple R	0.884049							
R Square	0.781543							
Adjusted R Square	0.776901							
Standard Error	5.569547							
Observations	601							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	9	65697.24	7299.694	235.3233	6.8E-189			
Residual	592	18363.76	31.01986					
Total	601	84061						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	10.48256	1.4416	7.271474	1.13E-12	7.651274	13.31384	7.651274	13.31384
Expectation of future price	0.698877	0.152721	4.576171	5.77E-06	0.398936	0.998817	0.398936	0.998817
Changes in propensity to travel	0.54858	0.158997	3.450248	0.0006	0.236313	0.860847	0.236313	0.860847
Fare of other operators on same route	0.494144	0.157329	3.140826	0.001769	0.185152	0.803136	0.185152	0.803136
Fare	0.429931	0.152348	2.822027	0.004932	0.130722	0.72914	0.130722	0.72914
Reliability of service	0.330078	0.15451	2.136294	0.033065	0.026624	0.633531	0.026624	0.633531
Frequency of operator's service	0.295306	0.152342	1.938436	0.053045	-0.00389	0.594503	-0.00389	0.594503
Taste and preference	0.215845	0.152495	1.415425	0.15747	-0.08365	0.515342	-0.08365	0.515342
Proximity to terminal	0.218754	0.154694	1.414109	0.157855	-0.08506	0.52257	-0.08506	0.52257
Advertisement/publicity	0.192443	0.155202	1.239954	0.215484	-0.11237	0.497256	-0.11237	0.497256

Source: Fieldwork, (2021)

### Factors influencing the choice of intercity bus operators by passenger of YSG transport service

The multiple regression value for YSGM is 0.928; this also implies that 92.8% of the criterion variable was explained by the predictor variables. The  $R^2$  value of 0.862 indicates that there is strong relationship between the dependent variable and the independent variable. The outcome of the regression analysis showed that choice of passenger for YSG transport company was influenced by Only six out of the nine independent variables, change in propensity to travel has ( $\beta=1.234$ ,  $p \leq 0.05$ ), reliability of service ( $\beta=0.997$ ,  $p \leq 0.05$ ), fare charged has ( $\beta=0.942$ ,  $p \leq 0.05$ ), taste and preference ( $\beta=0.886$ ,  $p \leq 0.05$ ), fare of other operators on the same route ( $\beta=0.695$ ,  $p \leq 0.05$ ), proximity to terminal ( $\beta=0.481$ ,  $p \leq 0.05$ ) (Table 9). This agrees with the study of Polat, (2012) which identified the following variables as patronage determinants: Fare, travel time walk access time and accessibility of the Transportation Company and reliability. The expectation of future price, frequency of operator's service and advertisement/publicity were not significant factors at all in the choice of this operator. YSGM is well known and has very large fleet over the years and on virtually all the routes, one would see their buses. Their built reputation still sustains their patronage to a large extent.

**Table 9** Regression Statistics for Factors influencing Choice of Operators for YSG

Multiple R	0.928207							
R Square	0.861567							
Adjusted R Square	0.857583							
Standard Error	7.735822							
Observations	538							
ANOVA								
	<i>Df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	9	197024.1	21891.56	365.8169	2E-220			
Residual	529	31656.92	59.84295					
Total	538	228681						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	17.78075	1.894603	9.384949	1.86E-19	14.05887	21.50264	14.05887	21.50264
Changes in propensity to travel.	1.234187	0.217274	5.680315	2.22E-08	0.807361	1.661014	0.807361	1.661014
Reliability of service	0.997529	0.228188	4.371514	1.49E-05	0.549262	1.445796	0.549262	1.445796
Fare	0.942854	0.223325	4.2219	2.85E-05	0.504142	1.381566	0.504142	1.381566
Taste and Preference	0.886972	0.225652	3.93071	9.59E-05	0.443688	1.330255	0.443688	1.330255
Fare of other operators on same route	0.695694	0.228891	3.039408	0.002488	0.246046	1.145341	0.246046	1.145341
Proximity to terminal	0.481862	0.218925	2.20104	0.028164	0.051794	0.91193	0.051794	0.91193
Expectation of future price	0.425146	0.228224	1.862845	0.063038	-0.02319	0.873483	-0.02319	0.873483
Frequency of operator's service	0.386482	0.218747	1.766803	0.077838	-0.04324	0.816201	-0.04324	0.816201
Advertisement/publicity	0.318862	0.225425	1.414492	0.157806	-0.12398	0.761701	-0.12398	0.761701

Source: Field work, (2021)

#### 4. CONCLUSIONS

Some of the bus companies offer luxurious bus services. However, all the bus companies' offer scheduled and chartered services. All the bus company have terminals across the study area, the bus company with the highest number of terminals operated is CHISCO and YSGM, while CHISCO and PMT have the highest number of routes plied. GIGM and YSGM has the best headway when compared to other company, in terms of average frequency of trip, PMT perform the best. In terms of departure time scheduled for buses by all the operators across their different terminal PMT has the best departure time when compared to all other bus services.

The study revealed that the bus company with the highest market share for revenue passenger kilometre for mini – buses is YSGM transport with 26.89% (21,898,806,900 RPK), while the bus company with the highest percentage market share of revenue passenger kilometre for coaches is ABC transport with 56.01% (19,499,500,000 RPK). For the intercity mini-buses, GIGM daily operation has the highest estimated revenue generated from the buses dispatched across all their terminal to different routes, while for coaches' daily operation, YSGM recorded the highest estimated revenue for buses dispatched from their terminal to different routed they served. Hence, this can be deduced that both GIGM and YSGM performed better than all other operators in daily revenue generated.

Passenger's choice of operator revealed that for ABC transport, advertisement, frequency of operator's service, reliability of service and expectation of future price were the most significant factors influencing choice of customers to use the operator's service. It was noted that these factor's respective *p-value* were 0.004, 0.015, 0.031 and 0.049 all well below the 5 percent threshold. The  $R^2$  value of 0.872 implies that 87% of the choice of operator for ABC transport was explained by the predictor variables.

For CHISCO transport, it was observed that among the factors influencing passenger's choice of this carrier, the frequency of operators' service with the value of 1.5E-05 (is the most significant factor), reliability of service has 0.022 fare has 0.034. This showed that passengers of CHISCO were more influenced by frequency of service by the operator. It was however observed that for GIGM all the factors influencing passengers' choice to travel with GIGM transport were all significant at 0.05 significant levels. This implied that GIGM have carved a niche for themselves over the years (in their short period of joining the sub-sector when compared with others) in the intercity bus industry.

For PMT, the significant factors influencing passenger's choice to patronize their buses are expectation of future price with the *p-value* of 5.77E-06, changes in propensity to travel with a *p-value* of 0.0006 fare of other operator has 0.0017, fare charged has 0.004 and reliability of service has 0.033. For YSG, only six out of the nine independent variables were significant with their *p-value* below the chosen 0.05 level of significance. Change in propensity to travel has a *p-value* of 2.22E-08, reliability of service has 1.49E-05, fare charged has 2.85E-05, taste and preference 9.59E-05, fare of other operators on the same route 0.0024, proximity to terminal 0.028. The study therefore recommend that frequency and reliability of service should be geared up by the respective intercity bus operators in other to improve their service quality to their existing customers and to attract other potential customers.

#### Informed consent

Not applicable.

#### Ethical approval

Not applicable.

#### Conflicts of interests

The authors declare that there are no conflicts of interests.

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#### Data and materials availability

All data associated with this study are present in the paper.



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